Appl. No. 10/802,625
Amnt. dated 6/9/06
Reply to Office Action of Feb 14, 2006

REMARKS/ARGUMENTS

Claims 1-14 are in the application. The Examiner has rejected claims 1, 2, 4, 6, 9, 10, 12, 13, and 14 under 35 U.S.C. § 103(a) as unpatentable over applicant cited background art, Examiner's notice, House et al. 4,365,306, Baziw 5,177,709, and Mercado 5,996,414. Claims 3, 5, 7, 8 and 11 are considered allowable by the Examiner if rewritten to include parent claim limitations. No claims are currently amended.

Obviousness Rejections Under 35 U.S.C. § 103(a):

Applicant requests reconsideration of the Examiner's claim rejections because none of the cited references, alone or in combination, teach or suggest the present method: driving a cone into the ground near a preexisting shaft, periodically striking the shaft and measuring the sound response at the cone while it is driven into the ground, and computing shaft depth.

An affidavit from one of the inventors is attached to provide background knowledge in the fields of pile driving and remote depth measurement of preexisting shafts.

Summary of cited references and their teachings:

House et al. measures "blows per distance driven" in order to determine, for example, when a pile has been driven as far as is reasonable (because of ground hardness and the like). See paragraphs 6, 10 and 11 of the attached affidavit. House et al. is making these measurements for this purpose. The remote sensing only measures the number of blows. It doesn't, and can't, measure the depth of the pile being driven. The depth of the pile being driven is physically measured directly at the pile. See paragraphs 5, 8 and 9 of the attached affidavit.

Applicant submits that House et al. does not teach anything relevant. Depth is not remotely measured by any means. Nothing about a preexisting shaft is measured. There is no motivation or teaching related to present invention.

Baziw teaches using a cone penetrometer to collect seismic data and test soil conditions "because such measurements provide insight into the response of soil to imposed loads" and the analyzed data "are used to predict settlement, liquefaction and failure." (Col. 1, lines 24-30).

Baziw teaches the use of a cone penetrometer to measure sound waves, in order to assess soil conditions. It does not measure the depth of anything. It doesn't measure anything about a preexisting shaft.

Mercado, like the present invention, is directed to the problem of remotely measuring the depth of preexisting piles. Mercado teaches a method of measurement wherein an array of sound sensors are affixed on or adjacent to the pile, and a sound wave is transmitted into the pile by striking the pile. The wave travels down through the pile and back up through the ground, where it is measured by the fixed array of sensors. The sensed waves are analyzed to determine pile depth.

The Examiner states that Mercado teaches the value of remotely measuring the depth of a structure. This is true. Mercado does teach remote sensing of the depth of a preexisting structure, but by a different method, involving fixed sensor measurements.

What none of the references, alone or in combination, teach is the present method: driving a sensing cone penetrometer into the ground near the preexisting shaft, while driving the cone, periodically striking the shaft and measuring the sound response at the cone, and from the response computing shaft depth. Furthermore, the combination of the references would not result in a device which would accomplish the method of the present invention.

Applicant wishes to clarify some other points regarding pile driving and remote depth measurements.

(1) Examiner states "it is presumptuous to assume the pile driver operators know the driven depth without measuring."

As shown in the attached affidavit, depth measurements of piles being driven are always done directly, by physically measuring the pile (usually this is accomplished by marking piles with depth increments, starting from the driven end of the pile). This is not just customary and sensible, but is required by civil codes (see paragraph (8) of the attached affidavit). There is no case known to applicant where the depth of a pile being driven was measured remotely.

(2) Examiner's contends that the term "preexist" "does not appear to have any effect or limitation on the method or process of measuring shaft depth."

In fact, as discussed above, depth measurement of shafts being driven is always done directly, by physically measuring the shaft.

Regarding House et al., "blows per distance driven" is measured in order to determine when a pile has been driven as far as is reasonable (because of ground hardness and the like). See paragraphs 10 and 11. House et al. is making these measurements for this purpose. The remote sensing only measures the number of blows. It doesn't, and can't, measure the depth of the pile being driven. The depth of the pile being driven is physically measured directly at the pile.

Preexisting shafts are measured remotely because there is no way to do a direct measurement. Shafts being driven are not measured remotely.

(2) Applicant traverses Examiner's contention that "a moving shaft can be considered to be preexisting."

Applicant submits that the plain meaning of the term "preexist" in the present context means existing prior to the testing process. Furthermore, Applicant amended claims 1, 9, and 14 in the Amendment submitted January 16, 2006 to refer to a "preexisting" shaft in response to the Examiner citing House et al., a reference concerned with measuring numbers of blows over distance driven, while driving a shaft. Applicant stated at that time "no one would measure the depth of a structure as they drove it into the ground . . . Depth measurements are made in the case of a preexisting structure whose depth isn't known." Finally, Applicant reiterates the argument that remote testing is only done with regard to already existing structures having an unknown depth. Depth measurements on structures being driven are always taken directly, by physical

distance measurements on the shaft portion remaining above ground. Please refer to the attached affidavit, especially paragraphs (8) and (9).

Independent claims 1, 9, and 14 are patentable for the reasons described above. The other claims are patentable as depending on an allowable claim, and also include additional patentable elements.

As all of the claims now in the application appear to be in condition for allowance, applicant respectfully requests that the application be allowed and passed to issue as soon as possible.

Respectfully submitted,
MACHELEDT BALES & HEIDMILLER LLP

By 

Jennifer L. Bales
Registration No. 38,070
Telephone (303) 664-4734
Facsimile (303) 664-4735